A BENCHMARKING STUDY OF AIR FORCE PROGRAM MANAGER COMPETENCIES

THESIS

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Abstract

Over the last decade, the Department of Defense (DOD) has redesigned its acquisition process and the allocation of funding which in turned has had a major effect on the Air Force Acquisition program management workforce. The current acquisition workforce continues to face serious shortages of highly skilled program managers resulting in programs and projects overrun, undermanaged, and unexplained increased cost. Highly skilled talent with the necessary technology competencies is in high demand. These skills are critical to the success of programs and mission accomplishments.

The purpose of this benchmarking study is to determine if the Air Force are developing and equipping their Program Manager (PM) with right competencies to be successful in program management. This study will identify and determine the PM competencies of the Air Force, FAI FAC-P/PM certification program, and Boeing. It will examine and analyze the Air Force certification requirement to FAI and PM competences to FAI and Boeing to determine any gaps exists.

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Acronym

AFMC	Air Force Materiel Command
APDP	Acquisition Professional Development Program
DAU	Defense Acquisition University
DAWIA	Defense Acquisition Workforce Improvement Act
DOD	Department of Defense
FAC-P/PM	Federal Acquisition Certifications for Program/Project Manager
FAI	Federal Acquisition Institute
GAO	Government Accounting Office
HCM	Human Capital Management
HCSP	Human Capital Strategic Plan
LCL	Life Cycle Logistics
MAJCOM	Major Command
NDAA	National Defense Authorization Act
OPM	Office of Personnel Management
OSD	Office of Secretary of Defense
PM	Program Manager
P/PM	Program/Project Manager
USAF	United States Air Force
USD/AT&L	Under Secretary of Defense for Acquisition, Technology, and Logistics

A BENCHMARKING STUDY OF THE AIR FORCE PROGRAM MANAGER COMPETENCIES

I. Introduction

Over the last decade, the Department of Defense (DOD) has redesigned its acquisition process and the allocation of acquisition funding which in turned has had a major effect on the Air Force Acquisition community. The Air Force Acquisition innovative strategic solution is developed by multi-skilled professionals who anticipate and deliver war-fighting capabilities (Air Force Acquistion). However, the budget cuts have affected the mission to acquire and support war-fighter capabilities through responsive business solutions and caused a reduction on the workforce. The acquisition community has taken on the challenge to transform and revise itself in order to perform efficiently in the present environment.

Significant changes in the Defense Acquisition civilian workforce have led to concerns and questions about the qualification of its acquisitions workforce. With years of downsizing, outsourcing, and recent buyout and early retirement offers, there have been major impacts on the sustainability of a qualified acquisition workforce. DOD reduced its civilian acquisition workforce resulting in implementation of acquisition reforms, base realignments and closures, and congressional direction. This has significantly impacted the Air Force manning and management of valuable programs. According to a Government Accounting Office (GAO) study, DOD Acquisition programs increased spending on goods and services by more than doubled to $388 billion in 2008 (GAO, 2008).

In a 2009 RAND report on defense acquisition, the DOD agencies were explored to determine the technical, psychological, and political reasons for chronic cost overruns in large, complex projects. There were 11 specific issues found that were important to the aspects of program complexity (Hayes, Kopunic, & Wood, 2011):

- Un-accommodated or misaligned stakeholder views of success. Failure to align expectations of powerful program stakeholders can slow, or derail, even the best efforts.
- Tension between product success and project success. Paradoxically, project outcomes like Boston's "Big Dig" tunnel and Sydney's Opera House are considered successful in hindsight, though at the time, they both were behind schedule and grossly over budget.
- Programs bending to political and public relations pressure. Lack of awareness and planning for events in a complex program's external environment result in rework costs, schedule slips, and possible cancellation.
- Lack of understanding or acknowledgement of nontechnical risk. Current program risk tools and techniques are focused on technical risks, but many program risks result from nontechnical leadership, organizational behavior, and human factors issues.
- Use of competition as a weapon. In a competitive environment with few bidders, winner-take-all competitions can threaten the corporate survival of the losers, driving undesirable behaviors like underbidding to win, protests, etc.
- Institutionalized procurement practices. Rigid, one-size fits-all procurement practices limit agility and flexibility in complex programs to respond to risks and opportunities.
- Few project managers are equipped to be project delivery leaders. Effective complex project managers must be trained and experienced leaders in a wide variety of disciplines, including engineering, law, economics, and human resources. They must also be selected from those leaders who have the personality to deal effectively with the uncertainty and volatility inherent in complex projects.
- Lack of opportunity for engagement between government and industry. Pre-award protocols are rigid and not well suited to full understanding and alignment of goals regarding the outcome and mutual benefits of the program.
- Future capabilities are predicated on obtaining rational estimates. Today's incentives drive unconstrained requirements, coupled with unrealistic cost/schedule estimates, leading to an unaffordable and unachievable war-fighting portfolio.

- Current tools and decision processes are unsuitable for analyzing uncertainty. New tools and techniques are needed for managing complex projects.
- There is an inevitability of scope creep, especially if the project is contracted too early. Programs dependent upon scientific or engineering breakthroughs for success are all too prevalent in the portfolio.

Background

In 1990, the Defense Acquisition Workforce Improvement Act (DAWIA) was passed to ensure standardization of acquisition workforce education, training, and career development. Under this act, DOD acquisition workforce certification training would be provided by Defense Acquisition University (DAU). DOD established acquisition workforce career fields which required certification be met and tracked to ensure that acquisition workforce members meet mandatory standards established for level I (basic), level II (intermediate), or level III (advanced) (DAU, 2007). For each career field and level, there are requirements in three areas—education, experience, and training.

In April 2000, responding to years of personnel reductions, the Under Secretary of Defense for Acquisition, Technology and Logistics (USD/AT&L) created the Acquisition 2005 Task Force to examine how the acquisition workforce could be reshaped. The Task Force identified new initiatives as well as existing DOD programs that were considered innovative approaches to recruiting, developing, and retaining its future acquisition workforce. Its first recommendation was to develop and implement human capital strategic planning for the acquisition workforce (The Acquisition 2005 Task Force, 2000).

In April 2009, after outsourcing jobs to save the government money, Defense Secretary Robert Gates announced that the 11,000 acquisition support positions currently performed by contractors would be in-sourced and converted into full-time career positions (Brodsky, 2009). In addition, 9,000 Defense procurement professionals would be hired by 2015, beginning with 4,100 in 2010 (Brodsky, 2009) . In total, the size of the acquisition workforce would increase from 127,000 to147, 000 -- the highest level since 1998 (Brodsky, 2009).

The DOD delegated authority and responsibility for the use of Expedited Hiring Authority. It allowed the military departments to "appoint highly qualified individuals to shortage category positions in the career fields … identified," according to a joint memorandum signed by the Under Secretary of Defense for Acquisition Technology and Logistics (USAT&L), and the Under Secretary of Defense for Personnel and Readiness (AT&L, 2007). The Strategic Human Capital Plan Update was replicated to accelerate and sustain the capability of the acquisition workforce and ultimately protect our national security interests (AT&L, 2007).

There were measures put in place to stabilize the staffing levels by placing restrictions on hiring and offering incentives to mitigate this problem. In May 2011, the Air Force implemented a hiring slow-down to reduce the projected growth of its civilian workforce in order to keep civilian staffing at fiscal 2010 levels (AF News, 2011). One person hired for every two new vacancies in areas covered by hiring controls, but this did not apply to current hiring actions when a job selection has already been made (AF News, 2011).

In August 2011, the Air Force implemented a 90-day hiring freeze to quickly reduce civilian strength levels to budgetary limits and enable future hiring to support the most critical mission requirements (Danner-Jones, 2011). In September 2011, Air Force announced civilian early retirement, separation incentive options to ensure civilian government employee staffing levels stay in line with what it was allowed in fiscal 2010 (Gildea, 2011). This lowered previous projected planning by 9 percent (Gildea, 2011). The Air Force prepared to give voluntary separation incentive payments to up to 6,005 civilian employees (Gildea, 2011). Air Force Materiel Command found that about 10 percent of the more than 60,000 workers surveyed expressed interest in the incentives (Ricks, 2011). In December 2011, the Air Force civilian workforce hiring freeze was lifted; however, the force still needed a 9000 authorization reduction. However, Air Force's broad range of high-value, complex systems require the need for a top-notch, highly competent program management civilian workforce.

The Air Force leader of the acquisition workforce is Air Force Material Command (AFMC). AFMC is the Air Force's largest command of personnel and funding delivering

war-winning expeditionary capabilities to the war fighter through development and transition of technology, professional acquisition management, exacting test and evaluation, and world-class sustainment of all Air Force weapon systems (AFMC, 2011). One of its five goals is to support the Air Force by recruiting, training and retaining a high-performing work force. Program Managers(PM) are part of this workforce. Figure 1shows the breakdown of AF PM Civilian workforce (IDEA, 2011) . AFMC makes up sixty-seven percent of the Air Force's PM civilian workforce.

MAJOR COMMAND (MAJCOM)	Total Assigned
AF GLOBAL STRIKE COMMAND (AFGSC)	43
AF ISR AGENCY (AFISRA)	1
AF OFFICE OF SPECIAL INVESTIGATIONS (AFOSI)	1
AF RESERVE COMMAND (AFRC)	10
AF SPECIAL OPERATIONS COMMAND (AFSOC)	16
AIR COMBAT COMMAND (ACC)	139
AIR EDUCATION AND TRAINING COMMAND (AETC)	301
AIR FORCE DISTRICT OF WASHINGTON (AF DC)	141
AIR FORCE MATERIEL COMMAND (AFMC)	2876
AIR FORCE SPACE COMMAND (AFSC)	346
AIR MOBILITY COMMAND (AMC)	187
PACIFIC AIR FORCES (PAF)	88
US AIR FORCE ACADEMY (USAFA)	3
US AIR FORCES EUROPE (USAFE)	121
TOTAL	4273

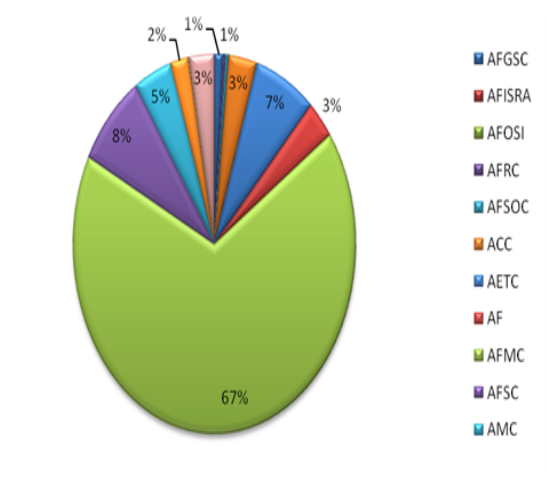


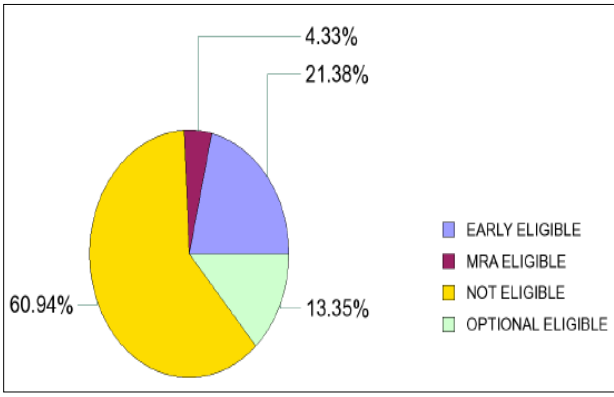
Figure 1: PM Civilian Workforce by MAJCOM

The majority of PMs are in the age range of 51-60 years of age as seen in Table 1 (IDEA, 2011).

Table 1: AFMC Program Manager Age Breakdown

Age	Ranges	Total
<31	115	5.13%
31-40	288	12.86%
41-50	772	34.46%
51-60	865	38.62%
>60	200	8.93%

Figure 2 indicates that thirty-nine percent of this population is eligible to retire which will put a damper on the workforce where it will suffer an imbalance in the skills, education, and experience (CHRIS, 2011).



Retirement Status Groupings	Total	Percentage
EARLY ELIGIBLE	479	21.38%
MRA ELIGIBLE	97	4.33%
NOT ELIGIBLE	1365	60.94%
OPTIONAL ELIGIBLE	299	13.35%

Figure 2: AFMC PM Eligible to Retire

Diminishing experience and knowledge will affect the Acquisition's workforce and its operational capabilities to carry out its mission. The shortage of PMs will continue to impact the Air Force mission. Figure 3 data indicates the reason is that the shortages are not distributed evenly over the units but are strongly concentrated in certain parts of the AFMC (CHRIS, 2011).

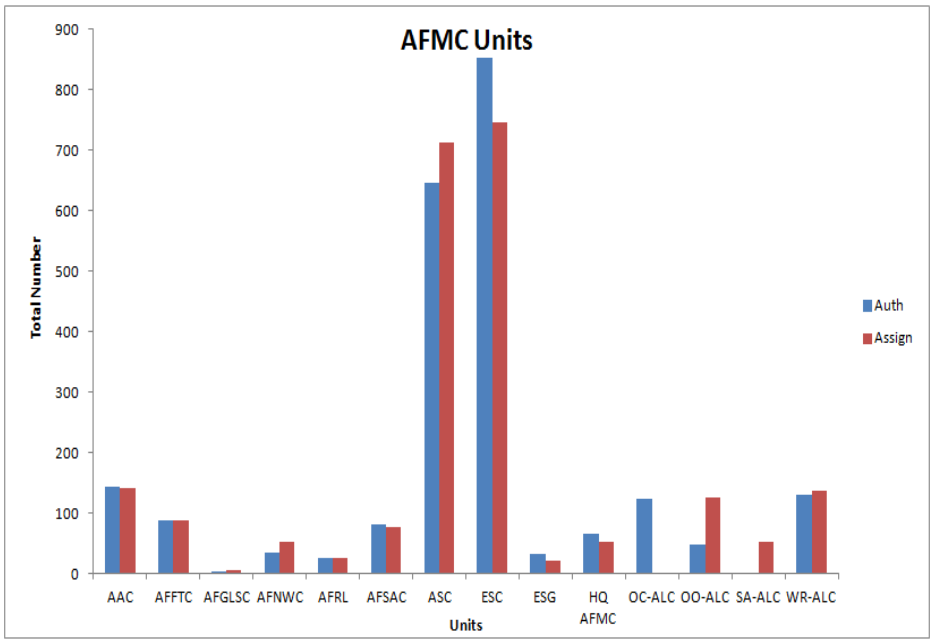


Figure 3: AFMC PM Civilian Workforce Manning by Units

The upcoming retirement trend will create a larger gap between current and future workforce of program managers based on levels of education, experience, training, retirement eligibility, and age. A gap in those factors affecting the competency of the PM workforce and with GAO reports criticizing DOD agencies acquisition workforce and overspending, there is a need to re-evaluate the competencies of PM.

Objective

The purpose of this benchmarking study is to determine if the Air Force is developing and equipping PMs with right competencies to be successful in program management. This study will:

1. Determine the PM competencies of the Air Force,
2. Determine the PM competencies of the Federal Acquisition Institute (FAI) certification program,
3. Determine the PM competencies of the successful industrial company, and
4. Compare and analyze the gap between Air Force PM to FAI and Boeing.

FAI is the primary organization providing knowledge and support to the federal acquisition workforce, focusing on fostering professional development throughout the lifecycle of each individual. In December 2011, President Obama has approved the Federal Acquisition Institute Act as part of the newly signed fiscal 2012 defense spending bill (FEDweek, 2012).The Federal Acquisition Institute Act seeks to ensure the consistency of training standards across the civilian acquisition workforce and better use of money going to training (Weigelt, 2010).

The industrial company with successful program management workforce used in this research is Boeing. Boeing is a recognized leader in providing and supporting large-scale systems that combine sophisticated communications networks with air-, land-, sea- and space-based platforms for military, government and commercial customers around the world (Boeing, 2012).

Research Questions

The current acquisition workforce continues to face serious shortages of highly skilled program managers resulting in programs and projects overrun, undermanaged, and increased cost. Highly skilled talent with the necessary technology competencies is in high demand in the private and public sectors. These skills are critical to the success of programs and mission accomplishments. This leads to addressing the following research questions:

1. How do the Air Force certification requirements align to FAI?
2. What competency model was used?
3. How do AF PM general/leadership and technical competencies align to FAI?
4. How do AF PM technical competencies align to FAI?
5. How do AF PM technical competencies align to Boeing?

Limitation

The bounds of this study are limited to actions directly relating to identifying .the competencies established by the Department of Defense for the Air Force. Manning levels are based on program managers currently assigned to AFMC. FAI is the only institute being analyzed against AF requirements. This study will focus on competencies

of Boeing as industrial company. These PM competencies are based on books, reports, and internet sources. The official developmental plans were not used.

Preview

This chapter has presented the general issues, objective, and research questions of this research effort. Chapter II surveys literature relevant to human capital and strategic planning, competencies, and program management. Several governments' regulations, instructions, and directives are visited to familiarize the reader with the strategic plan and training requirements for the program management career field. Chapter III discusses the AF certification and competencies for a PM. Chapter IV discusses benchmarking, the FAI PM certification program for a PM, and identifies the competencies at Boeing. Chapter V compares and determines gaps among AF, FAI, and Boeing. Chapter VI contains the conclusions and recommendations made as a result of this research effort. The study concludes with recommendations for further research efforts on this topic area.

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II. Literature Review

Human Capital and Strategic Planning

Over the past decade, there has been a major change in the workforce because of the uncertain economy and unskilled labor pool across the globe. The rapid development and influences of technology have effectively changed the way of businesses strategy and the fostering of employees. Companies have to focus on the actual quality of the employees available to perform work. Technology has made it necessary to continuously educate personnel and develop their technological skills so that they can contribute to the needs of the enterprises they work for. In today's highly technological business environment, human capital management is the key to success.

Human Capital is "the sum of knowledge, skills, experience and other relevant workforce attributes that reside in an organization's workforce and drive productivity, performance and the achievement of strategic goals" (Matthewman & Matignon, 2004) Human Capital Management (HCM) is the term used to describe an organization's multi-disciplined and integrated approach to optimizing the capabilities and performance of its management and employees (Higgins, 2008). People are the most fundamental asset to a company. Increasingly, business executives understand that human capital—the skills, talents, and motivation of employees—is truly an organization's most important asset and the only source of sustainable competitive advantage.

In fact, a growing body of research points to HCM as the single most important predictor of an organization's ability to outperform its competition (McBassi & Company, 2004). To deliver results, strategic decision-makers must integrate actionable, objective, and relevant information about employee skills and capabilities (Brain Bench, 2003). There must be short and long term HCM solutions, policies and programs to serve the needs of the organization (DOE, 2006). Developing and implementing a strategic workforce plan shows issues in the areas of recruiting, hiring, retention, succession planning, competency development, training and learning.

Strategic workforce planning addresses two critical needs: (1) aligning an organization's human capital program with its current and emerging mission and programmatic goals and (2) developing long-term strategies for acquiring, developing, and retaining staff to achieve programmatic goals (GAO, 2003). Five key principles that strategic workforce planning should address irrespective of the context in which the planning is done are shown in Figure 4 and listed below (GAO, 2003):

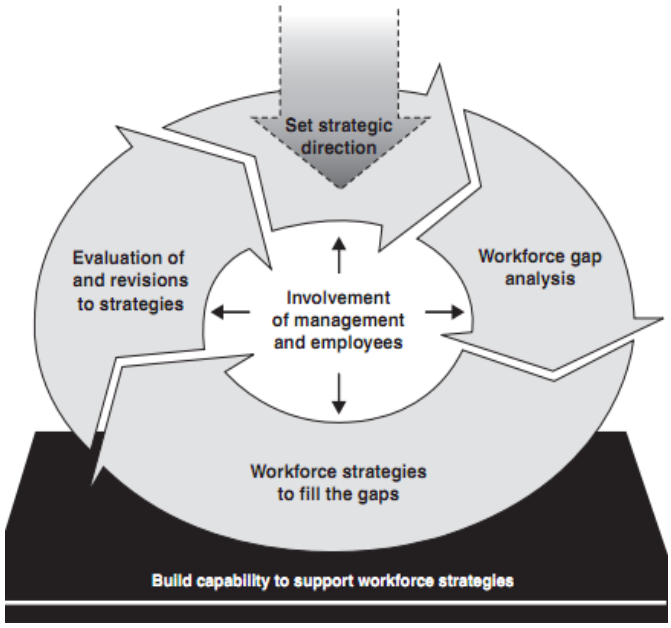

Figure 4: Strategic Workforce Planning Cycle

- Involve top management, employees, and other stakeholders in developing, communicating, and implementing the strategic workforce plan.
- Determine the critical skills and competencies needed to achieve current and future programmatic results.
- Develop strategies that are tailored to address gaps in number, deployment, and alignment of human capital approaches for enabling and sustaining the contributions of all critical skills and competencies.
- Build the capability needed to address administrative, educational, and other requirements important to support workforce planning strategies.

- Monitor and evaluate the agency's progress toward its human capital goals and the contribution that human capital results have made toward achieving programmatic results.

DOD and Air Force Strategic Planning Needs

With downsizing due to force shaping and early retirements, there has been a mismatch and imbalance workforce by age or experience. This has caused major human capital challenges resulting in severe lack of knowledge in certain areas. Effective human capital planning has helped DOD have the right people, with the right skills, doing the right jobs, in the right places, at the right time by making flexible use of its internal workforce and appropriately using contractors to support that workforce (GAO, 2010).

Since 2001, the GAO has listed federal human capital management as a government wide high-risk area. In 2009, GAO stated that ample opportunities remained for improving strategic human capital management to respond to 21st century challenges (GAO, 2009). A study by the GAO, entitled, *DOD Civilian Personnel, Comprehensive Strategic Work Plans Needed*, emphasized the importance of a strategic plan to address future civilian workforce needs (GAO, 2004). It also criticized the DOD's failure to develop a strategic plan to analyze those skills and competencies critical to mission accomplishment, and assess the "gaps" created when employees possessing those skills retire or otherwise leave the workforce (GAO, 2004).

In a February 2009 report, GAO recommended that DOD develop performance plans for its newly established program offices whose responsibilities are to oversee development of the overall civilian strategic human capital plan and the senior leader workforce plan in response to legislative requirements. Following the GAO study, the Office of the Assistant Secretary of the Air Force, developed an Acquisition Improvement Plan to recapture acquisition excellence and rebuild an Air Force acquisition culture that delivers products and services as promised, on time, within budget, and in compliance with all laws, policies and regulations (USAF, 2009). The plan established the below five goals that ensured rigor, reliability and transparency across the Air Force acquisition enterprise (USAF, 2009):

- Revitalize the Air Force Acquisition Workforce;

- Improve Requirements Generation Process;
- Instill Budget and Financial Discipline;
- Improve Air Force Major Systems Source Selections; and
- Establish Clear Lines of Authority and Accountability within Acquisition Organizations.

The Air Force failed to adequately manage professional development and maintain sufficient numbers of experienced professionals. The plan identified the following actions to support the revitalizing of Air Force acquisition workforce (USAF, 2009):

- Exploit newly delegated expedited hiring authority to fill current civilian vacancies;
- Increase and fund military and civilian personnel authorizations, as required;
- Fully utilize the recruitment, training, and retention funding derived from Section 852 of the FY08 National Defense Authorization Act (NDAA);
- Develop and implement recruitment and retention initiatives, including management training programs and bonuses where appropriate;
- Increase manning priority for civilian and military acquisition positions;
- Examine the mix of military and civilian acquisition personnel and the mix of Senior Executive Service and General Officers to ensure we have the right balance of military and civilian personnel to ensure leadership, experience and stability;
- Develop a succession planning procedure for acquisition leadership in functional specialties;
- Establish training and experience objectives as part of the career paths for each acquisition specialty and increase the availability of specialized training;
- Assess the acquisition workforce to determine the appropriate level of personnel needed to accomplish inherently governmental work and the level of support contractors needed to assist with work that is not inherently governmental; and

- Examine the possibility of re-assigning responsibility for acquisition workforce management to AFMC as the lead command.

The Secretary of the Air Force for Acquisition partnered with Air Force acquisition functional leaders and commands to develop an Air Force Human Capital Strategic Plan for the acquisition workforce to guide long-term efforts to meet acquisition workforce challenges (USAF, 2009). The plan established four acquisition human capital goals to place the appropriate trained people in the right place to successfully perform the Air Force acquisition mission (USAF, 2009). Figure 5 lists the four acquisition human capital goals followed by a breakdown of what each goal entailed (USAF, 2009).

Figure 5: Goals established in the Air Force Human Capital Strategic Plan (USAF, 2009)

Goal 1: Size the acquisition workforce based on program requirements.

- Develop a corporate Air Force-sanctioned, objective-based, workload-driven manpower model that predicts, defines and validates the manpower requirements needed to effectively develop, acquire and manage weapon systems

Goal 2: Shape and develop the acquisition workforce to meet current and future mission area demands.

- Establish a competency management, knowledge transfer and succession planning framework for Air Force acquisition that supports Center and MAJCOM workforce strategic planning.
- Replenish the Acquisition Workforce.
- Advance Air Force acquisition workforce development.
- Identify, protect and preserve critical expertise and capabilities.
- Foster succession planning across the acquisition enterprise.
- Engage in aggressive knowledge transfer Initiatives.

Goal 3: Increase the effectiveness of the acquisition workforce.

- Identify and address training gaps.
- Increase the rate at which individuals are fully trained *prior* to assignment to an acquisition position.
- Increase the institutional competencies of the acquisition workforce.
- Emphasize professional currency.
- Revitalize management of Key Leadership Position and Critical Acquisition Position qualifications and tenure.

Goal 4: Continuously improve policies, programs and processes for acquisition workforce engagement, development and management.

- Improve the execution and effectiveness of the Air Force Acquisition Professional Development Program (APDP).
- Automate processes to the maximum extent possible.
- Improve capability to provide accurate analysis, insightful reports and meaningful metrics relative to acquisition workforce management and development initiatives.

The Air Force deliberately develops acquisition professionals according to well defined career path models which serve as a guide for developing both military officers and civilians through assignments, education, and training.

Competency Development and Models

The definition of competency varies throughout organizations, industries, and countries. Some of the definitions are (Google, 2012):

- The quality of being adequately or well qualified physically and intellectually. -Princeton University
- Personal characteristics that contribute to outstanding performance in a particular role within a specific organizational context. -Massachusetts Institute of Technology
- A combination of skills, knowledge and other qualities defined by employers. -Swansea University
- Behaviors that contribute to and predict superior performance, such as how one performs a job rather than what is done. -Rensselaer Polytechnic Institute Human Resources
- The behaviour which employees must demonstrate or acquire in order to perform well. -University of York
- Characteristics that contribute to successful job performance and the achievement of organizational results. -State of Vermont
- Knowledge, skills, abilities, and behaviors. -United States Navy
- The measurable knowledge, skills, and observed attitudes that are required for effective workforce performance. -Cornerstone OnDemand
- Capabilities that set your business apart from others in the industry. They are abilities that can give you a unique and sustainable advantage over your competitors if you use them effectively. -Ampol Telecom
- A set of knowledge, skills and abilities obtained through formal or non-formal education, work experience, or other means required to perform a job. -HR Council for the Nonprofit Sector

Skills and abilities are linked to the organization and job by the competency model. “Competency modeling is the activity of determining the specific competencies that are characteristic of high performance and success in a given job. Developing competency models enable employees to achieve results aligned with business objectives to foster an organization's success. Organizations must understand their core competency needs - the skills, knowledge, behaviors, and abilities necessary for innovative business-driven results” (LaRocca, 2011).

There are six stages involved in defining a competency model for a given job role. These stages are (LaRocca, 2011):

- Performance criteria - Defining the criteria for superior performance in the role.
- Criterion sample - Choosing a sample of people performing the role for data collection.
- Data collection - Collecting sample data about behaviors that lead to success.
- Data analysis - Developing hypotheses about the competencies of outstanding performers and how these competencies work together to produce desired results.
- Validation - Validating the results of data collection and analysis.
- Application - Applying the competency models in human resource activities, as needed.

There are four major types of competency models (Kramer Consulting Solutions Inc, 2007):

- Job: Describe the behaviors, knowledge, and skills required for exceptional performance for any particular job. Career paths can be clearly defined that describe observable behaviors for a wide variety of jobs. The identification of top talent is enhanced due to the precise ability to evaluate specific competencies during the selection process.
- Functional: Define the most important standards of performance for individuals within any function. Competencies precisely describe functional

excellence for all jobs or positions within the function. Applications for the function are developed to support implementation.

- Core: Identify the critical skills, knowledge, and abilities that are required for success for all individuals in a particular organization. Common language and an agreed upon standard of performance among employees. Competencies developed defining steps of progression.
- Leadership: Describe the most important success factors for all executives or leaders within an organization or function. Road map of observable behaviors is to chart their future success. Very powerful when used in talent management and in executive coaching.

There are costs and benefits to each approach — however, the best model approach depends on the strategic goals of the organization and applications for which competency models will be used (Thinkwise Inc, 2007).

Program Management and Competencies

Program management is the process of managing related, and sometimes unrelated, projects, often with the intention of improving an organization's performance (Bahnmaier & McMahon, 2001). Four key considerations typically involved in a program are (Bahnmaier & McMahon, 2001):

• Cost to produce the system;
• Time required completing the effort;
• Capability/technical performance required to meet needs; and
• Contribution of the system to the overall defense operational and strategic plans.

Program Management consists of the planning, organizing, staffing, controlling, leading management functions, scheduling, budgeting, monitoring, directing, and maintaining consensus and support. The main five responsibilities are (Bahnmaier & McMahon, 2001):

- Planning addresses the program mission, objectives, goals, and strategy and includes all management activities that result in selection of a course of action.

- Organizing considers the resources involved and how are they related. This function addresses the alignment of people, funds, equipment, facilities, etc., and the structure of the organization in order to meet program goals; it identifies:
    - Authority—the power to make final decisions
    - Responsibility—the obligation to perform assignments
    - Accountability—the state of being answerable for the completion of an assignment.
- Staffing addresses the qualifications and special skills that may be required 3for persons assigned to each position in the program and the time phasing of assignments.
- Controlling is the function during which the manager monitors, measures, evaluates, and corrects program activities to ensure that actual operations conform to plans.
- Leading is the process whereby one individual exerts his/her influence over others in a group. Directing, an element of leadership, is the process of implementing, through the talents of others, the plans to meet program objectives. This includes training, supervising, delegating, motivating, counseling, and coordinating.

Difference between Program and Project Management

Throughout the literature review, program management was interchanged with project management. Although both manage projects, PMs may manage multiple projects at a time. “Program management competencies are built into the project management foundation. Some of the core project management competencies are a subset of program management competencies. Both project and program management reflects sound management practices” (Federal Working Group, 2007). Figure 6 represents this relationship (Federal Working Group, 2007).

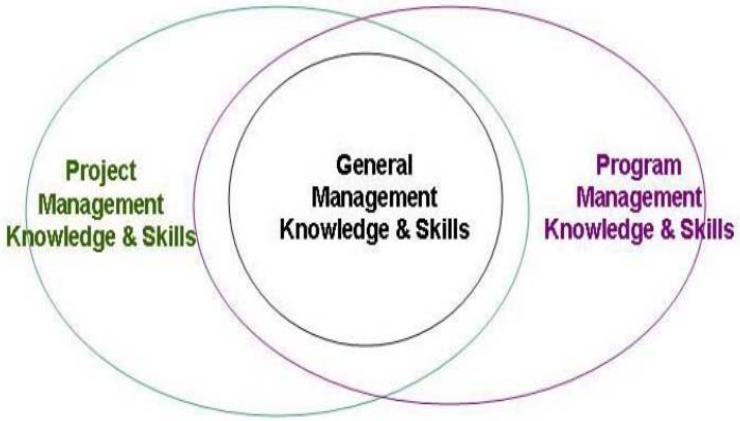

Figure 6: Program and Project Management Relationship

Project management is a subset of program management and serves as the bottom-level tier of the program management hierarchy--a hierarchy that consists of bottom-, middle- and top-level managers who make sure the company meets its strategic vision (Juarez, u.d.). Figure 7 provides an example of how program and project managers relate to one another.

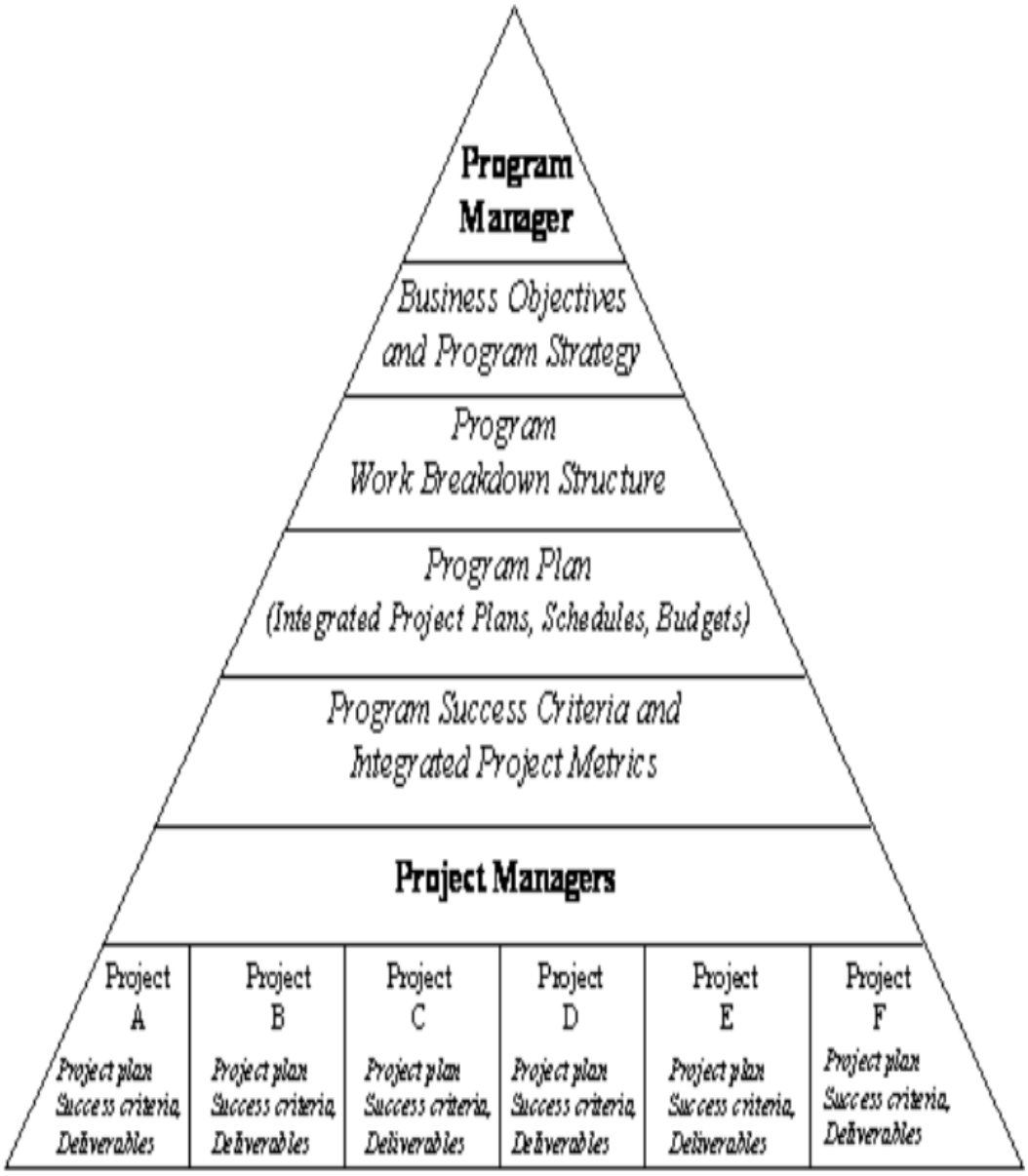

Figure 7: Program Management Hierarchy (Martinelli & Waddell, Program and Project Management: Understanding the Differences, 2004)

Table 2 breaks down how the responsibilities differ between Program and Project Managers (PM Hut, 2008).

Table 2: Program vs. Project Management

Parameter	Program Management	Project Management
Organization	Semi-permanent in nature, resourced to address the full range of business requirements associated with achievement of a strategic business objective. Resource requirements may be programmatic in nature and applied to all or major sets of projects undertaken to deliver the program	Transient organization in nature, resourced to address a limited set of requirements that may be more temporal in nature and not recurring through all project levels. Output oriented vs. outcome oriented
Organizational Alignment	Analogous to building a new company with a sharply defined strategic business objective. When existing owner organizations are adopting program management for the first time, organizational change management processes are an early activity to assure that owner elements understand their changed role in a program delivery approach	Team alignment around project and contract requirements. In joint venture or prime-sub project structures this alignment may include "cultural" alignment as well as team building activities
Outcome Definition	Strategic Business Outcome (enterprise viewpoint)	Defined scope, schedule and budget (output viewpoint)
Risk Management	Management of all risks associated with achievement of the defined strategic business objectives	Management of assumed risks
Requirements	Establish programmatic and system technical requirements and allocate as appropriate to	Manage project to meet the allocated programmatic and system technical requirements

	individual projects	
Interface Management	Management of all programmatic interfaces between defined projects as well as other programmatic interfaces with stakeholder groups	Management of allocated interfaces, if any, and all interfaces within the assembled project team
Execution Planning	Program wide execution planning including top level schedule, budget, performance standards, supply chain configuration and contracting strategy	Project execution planning consistent with agreed to scope schedule, budget. and performance standards
Sequencing	Sequencing of programmatic activities including defined projects; re-sequencing of projects and other programmatic activities as required to achieve the desired strategic business outcome	Sequencing of project activities to achieve project execution requirements within any programmatic constraints imposed by contract
Timeframe	Through achievement of strategic business objectives (more permanent in nature)	Duration associated with completion of project activities
Stakeholder Engagement	Identification and integration of stakeholders' interests and proactive engagement to assure achievement of strategic business objectives	Interaction with stakeholder groups only as contractually provided for

"Many organizations that take a purely project management approach to developing products and infrastructure find themselves struggling with the following problems:

- A chasm usually exists between business objectives and project management activities.

- Therefore projects may be `on target' with respect to time, cost and quality but fail to achieve the business results anticipated such as increased market share or increased worker productivity.
- Most efforts do not consist of a single project to achieve desired results, rather multiple projects with activities and deliverables that are tightly linked. The intricate interdependencies and common business objectives are many times left unmanaged.
- Resources seldom report directly to the person managing the development effort. Instead, they usually report directly to functional managers and are `loaned' to the project manager in a matrix manner. Many project managers are not adept in the leadership skills required to influence a team that does not directly report to them, nor have the breadths, depth or experience to successfully manage across a wide array of functional disciplines required to bring a new products to market" (Martinelli & Waddel, Program Management: Linking Business Strategy to Product and IT, 2003).

Program Management provides an organization more benefits to developing products and infrastructure (Martinelli & Waddel, 2003). The key benefits are (Martinelli & Waddel, 2003):

- Direct linkage of product and infrastructure development efforts to the strategies and objectives of the business.
- Improved communication and decision making for executive management.
- Similar or related projects possessing common objectives are linked into a coordinated and synergistic whole.
- Improved resource management and utilization across multiple projects, sites, and geographies.
- Effective risk management across multiple and inter-related projects and programs.
- More effective management of change and control of product "scope creep".
- Consistency in managing programs and projects and reporting of progress.

- Systematized processes for developing new products by linking all of the elements for managing successful product development.
- Cross-functional coordination and control contributing to improved time-to-market, cost, and quality for new products.
- Enables an effective project-oriented organization to reside concurrently and successfully within the framework of the traditional functional organization structure.
- Provides executive management the tools and capabilities for control and visibility of multiple programs occurring within the organization simultaneously.

Both project and program management reflects sound management practices. Therefore, training and experience in both are required to be an effective PM. Most successful organizations require PMs to obtain certifications. For over 30 years, FAI has provided federal agencies with workforce certification and continuous professional development for Program and Project Management (FAI, 2012). FAI is continuously performing studies and process improvements to ensure PMs are being equipped with the right skills and abilities.

A program and project management study was conducted by the FAI. The study surveyed 1,059 Program/Project Managers (P/PM) to determine how competence of the workforce (FAI, 2010). Table 3 shows the top three technical competencies P/PMs most identified as needing additional training and development in were Business, Cost Estimating, and Financial Management, Life Cycle Logistics (LCL), and Contracting (FAI, 2010). Table 4 shows the top three technical competencies where training and development would be beneficial to their organization were Business, Cost Estimating, and Financial Management, Requirement Development and Management Processes, and Life Cycle Logistics (LCL) (FAI, 2010).

Table 3: P/PM Technical Competency Training Need Based on Individual

Technical Competencies	Individual Training Needs
Business, Cost Estimating, and Financial Management	50.1%
Life Cycle Logistics (LCL)	45.9%
Contracting	35.0%
Test and Evaluation	33.6%
Requirement Development and Management Processes	32.9%
Systems Engineering	31.7%
Leadership/ Professional	21.1%

Table 4: P/PM Technical Competency Training Need Based on Organization

Technical Competencies	Organizational Training Needs
Business, Cost Estimating, and Financial Management	45.4%
Requirement Development and Management Processes	36.6%
Life Cycle Logistics (LCL)	32.6%
Contracting	32.1%
Leadership/ Professional	30.4%
Systems Engineering	28.0%
Test and Evaluation	26.5%

This study can be used as evidence that the PM workforce is need of more education and experience to be competent managing projects.

Summary

Literature reviews and studies show that program management needs are growing, but there is a need for a competent workforce manages programs successfully. FAI is a well-known and highly recognized certification programs among federal agencies for PMs. The next chapter identifies current AF PMs competencies. This will later be used to examine gaps between the FAI certification program and Boeing PMs competencies.

III. Expectation of Today's Program Manager

Air Force Program Manager Development

The Air Force's Acquisition Community is dedicated to developing qualified, well-balanced, multi-skilled civilian workforce of leaders and personnel with the knowledge, skills, and abilities to successfully manage programs effectively and efficiently (SecDef, 2009). The PM workforce ensures successful development, delivery, and management of major weapon systems and support systems required for today's and future challenges.

Developing and managing PM workforce is crucial to meet the day-to-day readiness challenges of sustainment (AFPC, 2011). PM professionals serve in a wide range of PM Office and Program Executive Office positions. Their fundamental responsibilities are to balance the many factors that influence cost, schedule, and performance; to interpret and execute the requirements of the DOD 5000 series regulations; and to ensure that high quality, affordable, supportable, and effective defense systems are delivered as quickly as possible (USD(AT&L), 2007).

The Air Force Acquisition PM is identified under the Civil Service career series 1101 regardless of the functional area. The series consist of a wide array of functions which are organized into 4 specialty areas: Weapon Systems, Services, Business Mgt Systems/IT, and International Acquisition (DAU, 2007). The types of assignment and responsibilities are based on the designated position certification.

Program Management Certification

Current program management certification standards required of Defense Acquisition Workforce are certified through the Defense Acquisition University. Core certifications are general for program managers (DAU, 2007). Core Plus represents an enhanced career field certification and development framework designed to guide acquisition professionals to competency development beyond the minimum standards required for certification, based on specific types of assignments within an acquisition function/ job assignments (DAU, 2007),

PMs must be assigned to an acquisition coded position to be certified. Certification requirements must be met within 24 months of assignment, but may be waived. Certifications are recognized and accepted across DOD organizations; however, certifications issued by federal (non DOD) organizations such as the Federal Acquisition Certifications (FAC) and certifications issued by the Department of Homeland Security are not accepted within DOD although the component parts may be transferable and applied to a DOD certification (DAU, 2007). Tables 5 -8 break down the responsibilities based on assignment and certification levels (DAU, 2007).

Table 5: Program Manager Assignments based on Certification Level I

Type of Assignment	Representative Activities
Weapon Systems	● Participates in an IPT delivering a weapon system, C2/network-centric system, or space system. ● Performs financial and status reporting and basic logistic activities. ● Supports pre-award contract activities and workload planning and scheduling.
Services	● Assists in acquisition planning, assessing risk (technical, cost and schedule), and contract tracking and performance evaluation.
Business Mgt Systems/IT	● Participates in a business process IPT, fundamentals of enterprise integration, and outcome-based performance measures.
International Acquisition	● Participates in a variety of international-related programs/tasks, either cooperative or security assistance in nature.
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● ACQ 101 Fundamentals of Systems Acquisition Management
Functional Training	● SYS 101 Fundamentals of Systems Planning, Research, Development, and Engineering ● CLB 007 Cost Analysis ● CLB 016 Introduction to Earned Value Management
Education	● Formal education not required for certification
Experience	● 1 year of acquisition experience

Core Plus Development Guide (Desired training, education, and experience)	Type of Assignment			
Training	**Wpn Sys**	**Services**	**Bus Mgt/IT**	**Intern Acq**
CLC 011 Contracting for the Rest of Us	✔	✔	✔	
CLE 025 Information Assurance (IA)	✔	✔	✔	✔
CLI 001 International Armaments Cooperation (IAC), Part 1				✔
CLI 002 International Armaments Cooperation (IAC), Part 2				✔
CLI 003 International Armaments Cooperation (IAC), Part 3				✔
CLL 008 Designing for Supportability in DoD Systems	✔	✔		
CLL 011 Performance Based Life Cycle Product Support (PBL)	✔	✔		
CLM 017 Risk Management	✔	✔	✔	
IRM 101 Basic Information Systems Acquisition	✔	✔	✔	
LOG 101 Acquisition Logistics Fundamentals	✔	✔		
PQM 101 Production, Quality, and Manufacturing Fundamentals	✔	✔		
SAM 101 Basic Software Acquisition Management	✔		✔	
TST 102 Fundamentals of Test and Evaluation	✔			
Education				
● Baccalaureate degree, preferably with a major in engineering, systems management, or business administration				
Experience				
● One (1) acquisition experience (in addition to core certification experience)				

Table 6: Program Manager Assignments based on Certification Level II

Type of Assignment	Representative Activities
Weapon Systems	● Structures and guides systems engineering activities. ● Establishes a risk/opportunity program; structures and conducts technical reviews. ● Works with contracting personnel. ● Maintains configuration control. ● Leads IPTs in support of developing and delivering a weapon system, C2/network-centric system, or space system.
Services	● Structures incentives tied to desired outcomes for service contracts, prepares plans for mitigating risks, provides contract tracking and oversight. ● Performs most acquisition planning tasks as established in Attachment 1 to AT&L Services Memo of Oct. 2, 2006.
Business Mgt Systems/IT	● Leads IPTs, identifies and manages enterprise-level business systems and issues, and applies performance measures within the acquisition community and program office context that directly impact systems under development.
International Acquisition	● Participates in successful cooperative development, production partnership, or system modification/transfer during pre-system acquisition or system acquisition with allied and friendly nations, either cooperative or security assistance in nature.
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● ACQ 201A Intermediate Systems Acquisition, Part A ● ACQ 201B Intermediate Systems Acquisition, Part B **(R)**
Functional Training	● PMT 251 Program Management Tools Course, Part I ● PMT 257 Program Management Tools Course, Part II ● CON 110 Mission-Support Planning ● or ● CON 115 Contracting Fundamentals ● and either of the following completed on or after Nov 15, 2005 ● SAM 101 Basic Software Acquisition Management ● or ● IRM 101 Basic Information Systems Acquisition
Education	● Formal education not required for certification
Experience	● 2 years of acquisition experience; at least 1 year of this experience must be in program management

Core Plus Development Guide (Desired training, education, and experience)	Type of Assignment			
Training	**Wpn Sys**	**Services**	**Bus Mgt/IT**	**Intern Acq**
BCF 215 Operating and Support Cost Analysis **(R)**	✔	✔	✔	
CLE 004 Introduction to Lean Enterprise Concepts	✔	✔	✔	
CLE 006 Enterprise Integration Overview			✔	
CLE 022 Program Manager Introduction to Anti-Tamper	✔			
CLI 004 Information Exchange Program (IEP), DoD Generic				✔
CLL 002 Defense Logistics Agency Support to the PM	✔	✔		
CLL 006 Depot Maintenance Partnering	✔	✔		
CLM 025 Commercial-Off-The-Shelf (COTS) Acquisition for Program Managers	✔	✔	✔	
CLM 031 Improved Statement of Work	✔	✔		
LOG 102 Fundamentals of System Sustainment Management'	✔	✔		
PQM 101 Production, Quality, and Manufacturing Fundamentals	✔	✔		
Education				
● Master's degree, preferably with a major in engineering, systems management, business administration, or a related field				
Experience				
● 2 additional years acquisition experience, preferably in a systems program office or similar organization				

Table 7: Program Manager Assignments based on Certification Level III

Type of Assignment	Representative Activities
Weapon Systems	● Leads and provides oversight of IPTs delivering a weapon system, C2/network-centric system, or space system. ● Leads tasks supporting pre-award contracts, financial management, risk management, systems engineering, total ownership cost determination, contract coordination, and communications.
Services	● Organizes and leads DoD professional, administrative, and management support service contracting as relates to developing clearly stated and actionable requirements packages. ● Coordinates with local procurement contracting officers, and ensures opportunities for socio-economic business concerns. ● Performs all acquisition strategy requirements actions noted in Attachment 1 to AT&L Services Memo of Oct. 2, 2006.
Business Mgt Systems/IT	● Oversees transformation integration, planning and performance, and investment management as applies to the acquisition community, program office(s), and system(s) under development.
Core Certification Standards (Required for DAWIA certification.)	
Acquisition Training	● None required
Functional Training	● BCF 102 Fundamentals of Earned Value Management ● BCF 103 Fundamentals of Business Financial Management ● LOG 103 Reliability, Availability, and Maintainability (RAM) ● PMT 352A Program Management Office Course, Part A ● PMT 352B Program Management Office Course, Part B **(R)** ● SYS 202 Intermediate Systems Planning, Research, Development, and Engineering, Part I
Education	● Formal education not required for certification.
Experience	● 4 years acquisition experience with at least: ● - 2 years in a program office/similar organization (dedicated matrix support to a PM, PEO, DCMA program integrator, or supervisor of shipbuilding) ● - 1 year in a program management position with cost, schedule, and performance responsibilities

Core Plus Development Guide (Desired training, education, and experience)	Type of Assignment		
Training	**Wpn Sys**	**Services**	**Bus Mgt/IT**
ACQ 265 Mission-Focused Services Acquisition **(R)**		✔	✔
ACQ 370 Acquisition Law **(R)**	✔	✔	✔
ACQ 452 Forging Stakeholder Relationships **(R)**	✔	✔	✔
BCF 207 Economic Analysis **(R)**	✔	✔	✔
BCF 209 Acquisition Reporting for MDAPs and MAIS **(R)**	✔		✔
CLE 008 Six Sigma: Concepts and Processes	✔	✔	✔
CLE 301 Reliability and Maintainability	✔	✔	
CLL 022 Title 10 Depot Maintenance Statute Overview	✔	✔	✔
CLL 201 Diminishing Manufacturing Sources and Material Shortages (DMSMS)	✔	✔	✔
LOG 200 Intermediate Acquisition Logistics, Part A	✔	✔	
LOG 201 Intermediate Acquisition Logistics, Part B **(R)**	✔	✔	
LOG 204 Configuration Management	✔		✔
LOG 235 Performance-Based Logistics	✔	✔	
PMT 403 Program Manager's Skills **(R)**	✔	✔	✔
PQM 201A Intermediate Production, Quality, and Manufacturing, Part A	✔		
SAM 301 Advanced Software Acquisition Management **(R)**	✔	✔	✔
SYS 203 Intermediate Systems Planning, Research, Development, and Engineering, Part II **(R)**	✔		
TST 203 Intermediate Test and Evaluation **(R)**	✔		
Education & Experience			
● At least 24 semester hours from among accounting, business finance, law, contracts, purchasing, economics, industrial management, marketing, quantitative methods, and organization and management (DANTES equivalency may be substituted)			
● 2 additional years of acquisition experience, preferably in a systems program office or similar organization (in addition to core exper)			

Developmental Competency Levels

A PM must meet the required education and experience to receive the required certification level for the position. Civilians enter federal service at any grade, depending on the job for which they apply and their educational/experiential background. Although a degree is not always mandatory for hiring purposes, the work does require the various skills gained through college level education or through increased responsibility experience (AFPC, 2011). Civilians progress through development levels from Tactical Level (GS 5-12 or equivalent) to Operational Level (GS 13/14 or equivalent) to Strategic Level (GS 15 or equivalent) (AFPC, 2011). Using training and leadership development programs, the program manager workforce will receive continuous education, training, mentoring, self development, and experiences to further their career development.

Tactical Development Competencies

The Tactical Development level is the basic developmental stage and the foundation of technical knowledge for the PM. The main objective of this stage is to understand and develop basic PM competencies. The stage helps develop institutional, communication and leadership skills, and requires a formal education in business disciplines essential to a PM professional. Table 8 shows the competencies developed during the Tactical Development level.

Table 8: Tactical Developmental Competencies for Program Managers

TECHNICAL	INSTITUTIONAL
· Skills required by CFETP	·Employing Military Capabilities
· Contracting/Procurement	· Enterprise Perspective
· Earned Value Management	· Managing Orgs & Resources
· Project Management	· Strategic Thinking
· Risk Management	· Leading People
· Systems Acquisition	· Fostering Collaborative Relationships
	· Communicating
GENERAL	**LEADERSHIP**
· Problem Solving	· Team Building
· Oral Communication	· DoD Mission and Culture
· Creative Thinking	· Accountability
· Self-Management	· Decisiveness
· Resilience	· Influencing/Negotiating
· Flexibility	

Operational Development Competencies

The Operational Development level focuses on the skills necessary to execute operations by being exposed and learning more in-depth PM competencies and experience. This phrase provides a better understanding of the Air Force, its mission, and its people. Further training and experience at this level prepares the PM for next level. This is the fully qualified level within the PM career field, and the PM assumes supervisory roles, pursue career broadening opportunities, and complete graduate education for an expansion of knowledge base and business skills. This is the level where it is highly recommended the PM pursue various assignments to increase their knowledge and experience. Table 9 shows the competencies developed during the operational level.

Table 9: Operational Developmental Competencies for Program Managers

TECHNICAL	INSTITUTIONAL
· Skills required by CFETP · Contracting/Procurement · Earned Value Management · Project Management · Risk Management · Systems Acquisition	· Employing Military Capabilities · Enterprise Perspective · Managing Orgs and Resources · Strategic Thinking · Leading People · Fostering Collaborative Relationships · Embodies Airman Culture · Communicating
GENERAL	**LEADERSHIP**
· Interpersonal Skills · Influencing/Negotiating · Problem Solving · Customer Service · Planning/Evaluating · Oral Communications	· Human Capital Management · Leveraging Diversity · Conflict Management · DoD Corporate Perspective · Developing Others · National Security Foundation

Strategic Development Competencies

The Strategic Development level focuses on developing strategic leaders who are expected to have served in more than one career field, and at more than one geographic location, and higher headquarters positions. Strategic leaders should possess exceptional occupational skills and institutional competencies to apply broad professional leadership capabilities and strategic approaches to lead acquisition organizations. A key

responsibility of a PM in this level is to use effective communication skills to share technical expertise, and mentor junior and fellow PMs. Table 10 shows the competencies developed during the tactical level.

Table 10: Strategic Developmental Competencies for Program Managers

TECHNICAL	INSTITUTIONAL
- Contracting/Procurement - Earned Value Management - Project Management - Risk Management - Systems Acquisition	- Employing Military Capabilities - Enterprise Perspective - Managing Orgs & Resources - Strategic Thinking - Leading People - Fostering Collaborative Relationships - Embodies Airman Culture - Communicating
GENERAL	**LEADERSHIP**
- Technology Management - Financial Management - Creativity & Innovation - Partnering - Entrepreneurship - National Defense Integration - National Security Environment	- External Awareness - Vision - Strategic Thinking - Political Savvy - Global Perspective - National Security Strategy

Summary

Many companies and agencies are developing PM occupations during this technological transformation to handle multiple projects. Some agencies have paved the way with innovative practices and comprehensive changes that serve as resources for other organizations interested in completing the PM transition. The next chapter will discuss benchmarking and examine the PM competencies of the FAI certification program and Boeing. Those general and technical expertise, skills, and competencies will compare to those of the AF PM in a further chapter.

IV. Benchmarking and Successful Program Management Competencies

Benchmarking

Benchmarking is the process of comparing and measuring your organization against others, anywhere in the world, to gain insights into measures, performance, and practices in a way that can rapidly improve the journey to world-class performance (APQC, 2012). Figure 8 show that benchmarking is a continuous, evolving cycle with six distinct phases (Caturano and Company, 2012):

1) Planning and setting scope and goals
2) Gathering the relevant data and information
3) Assessing and analyzing the data
4) Creating an action plan based on the analysis and desired changes
5) Executing and implementing the action plan
6) Reviewing results and recalibrating metrics based on expected vs. actual results

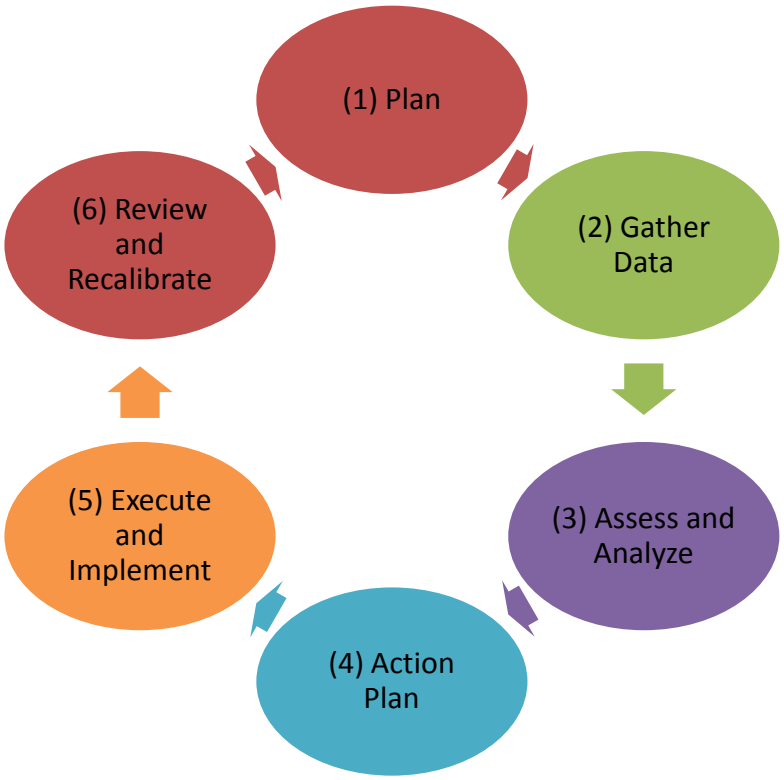

Figure 8: Benchmarking Process

There are four types of benchmarking (SM Thacker & Associates , 2010):

- Strategic Benchmarking
  - Concerned with comparing different companies' strategies and assessing the success of those strategies in the marketplace.
  - Analyses the strategies with particular reference to: strategic intent, core competencies, process capability, product line, strategic alliances, and technology portfolio.
  - Ensures a co-ordinated strategic direction regarding benchmarking and reduces the possibility that one improvement project will cancel out the effect of another. Benchmarking candidates are normally direct competition.
- Functional Benchmarking
  - Investigates the performance of core business functions.
- Best Practices Benchmarking
  - Applies to business processes.
  - Breaks the function down into discrete areas that are the targets for benchmarking and is therefore a more focused study than functional benchmarking.
- Product Benchmarking
  - Commonly known as reverse engineering or competitive product analysis.
  - Assesses competitor costs, product concepts, strengths and weaknesses of alternative designs and competitor design trade-offs, by obtaining, stripping down and analyzing competitors' products.

"The problem with more general benchmarking is that you are unable to drill down to the right level of granularity unless you get inside information" (Jones, 2004). To get the necessary information, benchmarking takes place at different levels (Jones, 2004):

- Internal- Looking at the differing levels of performance within your own organization and highlighting best practice for dissemination to other parts
- Competitor/peer- Analyzing those firms that you regard as competitors or peers

- Best in Industry- Focusing on the firm that you consider to be the leader in your own field/industry sector and finding out what it is that it does that is so much better than you
- World Class - Deciding that no matter what industry sector you are in - you wish to compare what you do against the best in the world.

Some of the benefits of benchmarking are (SM Thacker & Associates , 2010):

- To provide realistic and achievable targets
- To prevent companies from being industry led
- To challenge operational complacency
- To create an atmosphere conducive to continuous improvement
- To allow employees to visualize the improvement which can be a strong motivator for change
- To create a sense of urgency for improvement
- To confirm the belief that there is a need for change
- To help identify weak areas and indicates what needs to be done to improve.

Many companies have benchmarked successful programs, processes, and products to stay afloat in the declining economy. “As federal agencies have been reinventing their operations to become more businesslike, many have been benchmarking against world-class private sector companies, other organizations, and other federal agencies that have become really good at what they do” (Cavanagh, 2000). In this study, FAI program management certification and Boeing program management will be the successful programs to be examined.

Federal Acquisitions and Program Management

Although DAU is responsible for training the DOD agencies, the FAI provides training programs for federal procurement officials. FAI was established in 1976 under the Office of Federal Procurement Policy Act. FAI facilitates and promotes career development and strategic human capital management for the acquisition workforce (FAI, 2012). FAI supports more than 50 comprehensive training courses in traditional

and distance settings that range from the entry-level “Shaping Smart Business Arrangements” to team training such as “Performance Based Acquisition” and focused topics on "Risk Management" and "Earned Value Management" to prepare men and women for leadership in the acquisition workforce in which they serve (FAI, 2007).

FAI mission is to foster and promote the development of a professional acquisition workforce and is responsible for performing a wide range of activities supporting management of the acquisition workforce with the following priorities (OFPP, 2005):

- Establish general performance measures for assessing agency acquisition workforce development programs
- Support the identification, development and maintenance of core acquisition workforce competencies
- Establish career development programs to assist the workforce in competency and skill development
- Establish and administer federal acquisition certification programs
- Manage the Acquisition Workforce Training Fund (AWTF)

FAI seeks to ensure availability of exceptional training, provide compelling research, promote professionalism, and improve acquisition workforce management (OFPP, 2005). FAI works to improve federal acquisition by (FAI, 2007):

- Developing and evaluating instructional material and performance tools for acquisition personnel and facilitating interagency intern and training programs
- Identifying the competencies that support successful performance and the development of business leaders
- Promoting and coordinating government-wide research and studies to improve the acquisition process
- Helping agencies identify and recruit highly qualified candidates for acquisition jobs
- Office of Federal Procurement Policy (OFPP) Policy Letter 05-01,
- Developing and Managing the Acquisition Workforce, established a requirement for federal acquisition certification programs.

Federal Acquisition Certification for Program and Project Managers

One of FAI certification program is the Federal Acquisition Certification for Program and Project Managers (FAC-P/PM). The purpose of FAC-P/PM is to establish general training and experience requirements for program and project managers in civilian agencies (FAI, 2007). Since PMs are evolved and seasoned project managers, FAI established a single certification program for both. The FAC-P/PM focuses on essential competencies needed for program and project managers; the program does not include functional or technical competencies, such as those for information technology, or agency-specific competencies (FAI, 2007). Certifications are recognized and accepted across federal agencies except the DOD (FAI, 2012). There is a Statement of Understanding with Project Management Institute to recognize one another's certifications if the required experience and skills have been met (FAI, 2012).

The certification is not intended to confer qualification for any specific assignment as a program or project manager within an agency, as the assignment of personnel is an agency-specific function, but provides a structured approach to developing program and project managers (FAI, 2007). PMs do not have to be assigned to an acquisition coded position to be certified. The FAC-P/PM is not mandatory for all program and project managers; however, at a minimum, program and project managers assigned to programs considered major acquisitions must be senior-level certified unless a waiver is granted by the appropriate agency official (FAI, 2007).

FAI recommends that at a minimum that agencies shall consider applying the FAC-P/PM requirements to the following (FAI, 2007):

- individuals with significant involvement in one or more levels of the acquisition investment process (initiation, conceptualization/design, development, implementation, modification, maintenance, evaluation, disposal),
- managers with authority and responsibility for overseeing multiple levels of the acquisition investment process,
- individuals with responsibility for leading cross-agency or acquisition investment programs for a major portion or all of the investment life-cycle,

- individuals responsible for leading, coordinating, managing integrated project teams for acquisition investments,
- individuals participating on an integrated project team or a level of the investment lifecycle with aspirations for career development as a program or project manager.

Figure 9 describes the P/PMs positions that should attend FAC-P/PM (Learning Tree International, 2012) .

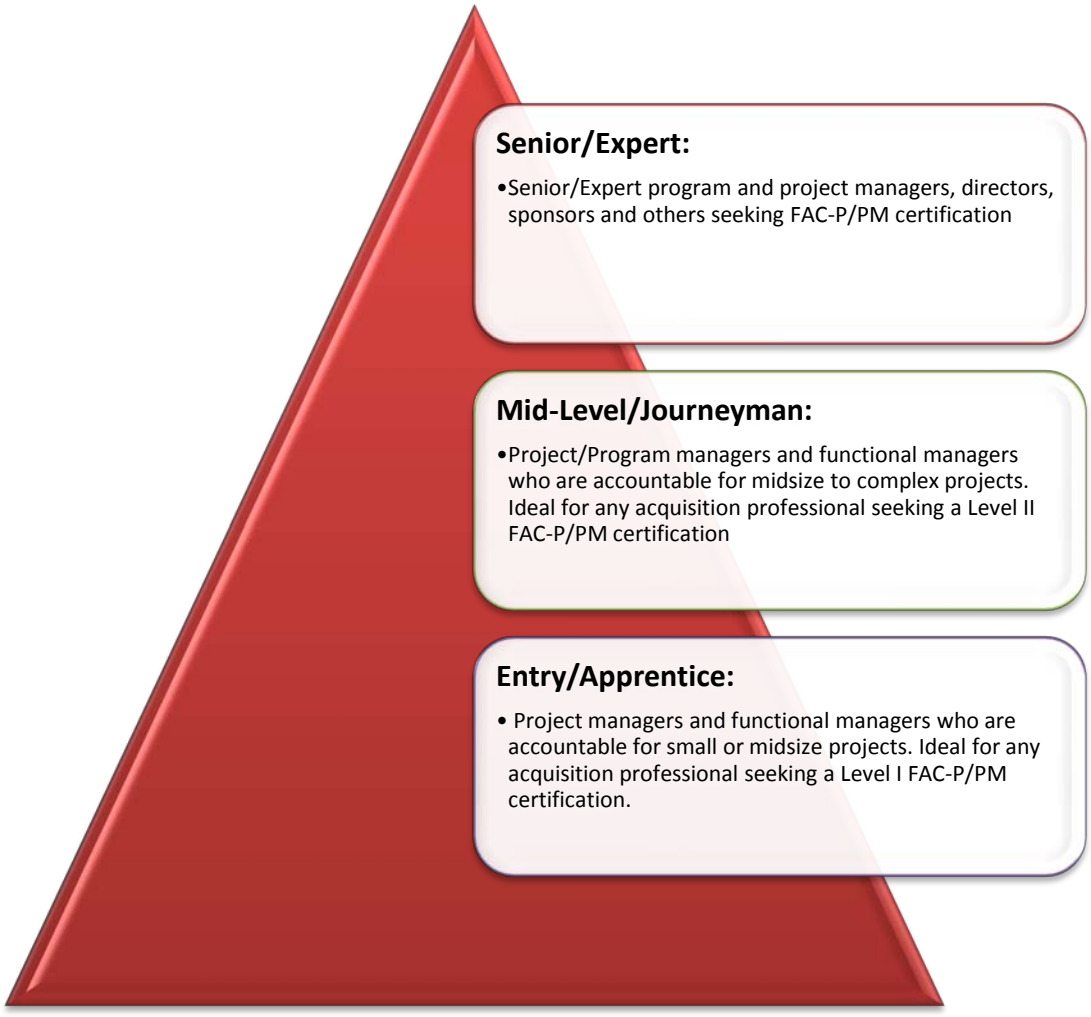

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Figure 9: FAI Level Hierarchy

The program includes three different levels of certification, depending on the core competency, training, and experience required to manage core competencies vary by

certification level and are designed to build commonality across the federal government's acquisition workforce (FAI, 2012). Certification requirements must be met within 12 months of assignment, but may be waived (FAI, 2007).

Table 11: FAC-P/PM Entry/Apprentice Level

At the **Entry/Apprentice** level, program and project managers should have, through training, experience, and other development activities:	
· Knowledge and skills to perform as a project team member · Ability to manage low risk and relatively simple projects or to manage · Overall understanding of project management practices, including · Recognition of an agency's requirements development processes · Ability to define and construct various project documents, under supervision · Understanding of and involvement in the definition, initiation, conceptualization or design of project requirements	
Experience	
At least **one** year of project management experience within the last five years.	
Entry Level Project Management Competencies	
Technical	**Leadership/Professional**
Requirements Development and Management Processes Systems Engineering Test and Evaluation (T&E) Life Cycle Logistics (LCL) Contracting Business, Cost Estimating & Financial Management	Oral Communications Problem Solving Conflict Management Interpersonal Skills Resilience Flexibility Accountability Written Communication Customer Service

Table 12: FAC-P/PM Mid-Level/ Journeyman

At the **Mid-Level/Journeyman level**, program and project managers should have, through training, experience, and other development activities:	
· Knowledge and skills to manage projects or program segments of low to moderate risks with little or no supervision · Ability to apply management processes, including requirements development processes and performance-based acquisition principles, to support the agency's mission to develop an acquisition program baseline from schedule requirements, plan technology developments and demonstrations and apply agency policy on interoperability · Ability to identify and track actions to initiate an acquisition program or project using cost/benefit analysis · Ability to understand and apply the process to prepare information for a baseline review, and can assist in assist in development of Total Ownership Cost (TOC) estimates · Ability to manage projects as well as program segments and distinguish between program and project work	
Experience	
At least **two years** of program or project management experience **within the last five years** that includes experience at the entry level	
Mid-Level/Journeyman Program and Project Management Competencies	
Technical	**Leadership/Professional**
Management Processes Systems Engineering Test and Evaluation (T&E) Life Cycle Logistics (LCL) Contracting Business, Cost Estimating & Financial Mgmt	Influencing/Negotiating Partnering Team Building/IPT Conflict Management Political Savvy Strategic Thinking Decisiveness Creativity/Innovation External Awareness Developing Others

Table 13: FAC-P/PM Senior/Expert Level

At the **Senior/Expert level**, program and project managers should have, through training, experience, and other development activities:	
· Knowledge and skills to manage and evaluate moderate to high-risk programs or projects that require significant acquisition investment and agency knowledge and experience · Ability to manage and evaluate a program and create an environment for program success · Ability to manage and evaluate the requirements development process, overseeing junior level team members in creation, development, and implementation · Expert ability to use, manage, and evaluate management processes, including performance-based management techniques · Expert ability to manage and evaluate the use of earned value management as it relates to acquisition investments	
Experience	
At least **four years** of program and project management experience on federal projects and/or programs, including managing and evaluating agency acquisition investment performance, developing	
Senior/Expert Level Program Management Competencies	
Technical	**Leadership/Professional**
Management Processes Test and Evaluation (T&E) Life Cycle Logistics (LCL) Contracting Business, Cost Estimating & Financial Mgmt Systems Engineering	Strategic Thinking External Awareness Vision Entrepreneurship

The FAI certification programs are ranked high for federal acquisition workforce success. FAC-P/PM certification ensures that P/PMs are equipped with the right competencies to perform their duties and responsibilities efficiently and effectively.

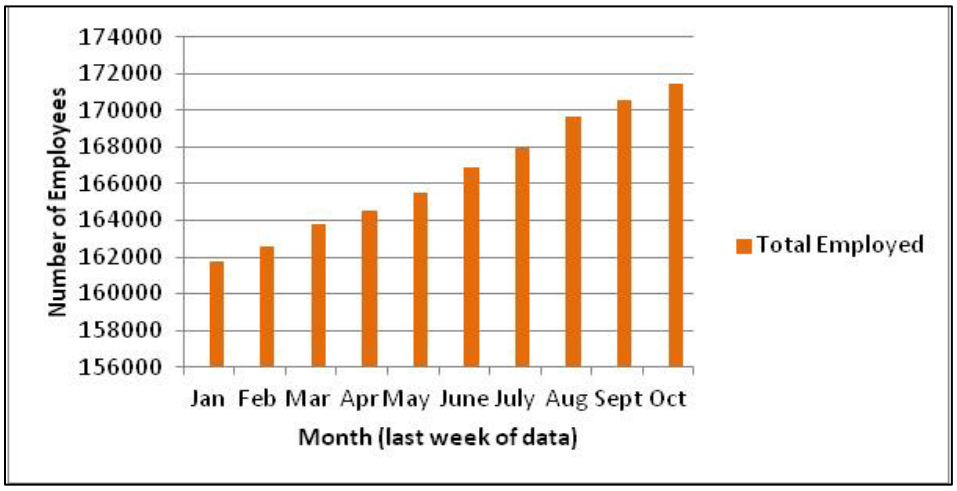
Boeing and Their Acquisitions Program Management

More companies have incorporated program management process measures in the day-to-day management of their organization. One of those companies that have been successful with it is Boeing. Boeing has made PM development a key part of its business process to ensure effective management of their programs effectively allowing it to transform into the world-class performer it is today (Boeing, 2012).

Boeing is the world's largest aerospace company and leading manufacturer of commercial jetliners and defense, space and security systems (Boeing, 2012). Based in over 150 countries, Boeing produces and services commercial and military aircraft, satellites, weapons, electronic and defense systems, launch systems, advanced information and communication systems, and performance-based logistics and training (Boeing, 2012). As a key leader in innovative management and leadership, it is expanding its capabilities to creating new, more efficient members of its commercial airplane family; integrating military platforms, defense systems and the war-fighter through network-enabled solutions; creating advanced technology solutions; and arranging innovative customer-financing options (Boeing, 2012).

The rapidly changing economy and resulting technological changes have taken a toll on many companies forcing them to downsize to stay competitive. Although Boeing has been affected in some areas, it is continues to grow and employ more people. Table 12 shows Boeing hired over 9000 more workers by October 2011 for CY2011 (Boeing, 2011).

Table 14: Total Employment by Month



The breakdown and distribution of hired workers among industries is shown in Table 15.

Table 15: Breakdown of Employment by Group

Employment by Group	Jan. 27, 2011	Feb. 24, 2011	Mar. 31, 2011	Apr. 28, 2011	May 26, 2011	June 30, 2011	July 28, 2011	Aug. 25, 2011	Sept. 29, 2011	Oct. 27, 2011
Commercial Airplanes	67,344	68,109	69,114	70,014	71,099	72,775	74,169	76,313	77,469	78,450
Defense, Space & Security	64,958	65,039	65,189	65,014	64,794	64,271	63,970	63,551	63,281	63,111
Corporate										
Engineering, Operations & Technology	19,063	19,070	19,106	19,071	19,194	19,360	19,347	19,303	19,296	19,297
Shared Services Group	7,791	7,787	7,781	7,799	7,830	7,848	7,845	7,878	7,890	7,919
Other	2,584	2,597	2,593	2,597	2,594	2,621	2,634	2,645	2,654	2,671
Total Employed	161,740	162,602	163,783	164,495	165,511	166,875	167,965	169,690	170,590	171,448

Boeing believes in running a healthy core business, leveraging their strengths into new products and services, and opening new frontiers (Boeing, 2012). There are certain business imperatives on which Boeing places a very strong emphasis (Boeing, 2012):

- Detailed customer knowledge and focus that understand, anticipate and respond to customer needs.

- Large-scale systems integration that continually develops and advances technical excellence.
- A lean enterprise characterized by efficiency, supplier management, short cycle times, high quality and low transaction costs.

One of Boeing's primary customers is the U.S. Air Force. The Boeing's Air Force Systems business segment uses Process-Based Management (Garretson & Harmon, 2005). Boeing Process-Based Management (PBM) is a management approach that defines an organization as a collection of processes focused on customer satisfaction and waste reduction by defining measures, and stabilizing and improving processes (Garretson & Harmon, 2005). Boeing program managers play a key role in the success of process management. With various customers and projects, it is important to ensure the development of PMs is aligned with the organization's values and visions. PMS are molded to being successful leaders possessing the competencies in Figure 10 (Boeing, 2011).

Charts the Course

- Starts with the customer ends with the customer.
- Translates strategy into actionable objectives and plans.
- Conveys sense of purpose and mission that motivates others.
- Maintains direction, balancing big-picture concern with day-to-day issues.

Delivers Results

- Keeps his/her promises. Does not rationalize shortfalls and is accountable.
- Demonstrates strong operational skills. Marshals the other Leadership Attributes in meeting commitments.
- Capitalizes on unanticipated opportunities and changing circumstances to meet commitments.

Finds a Way

- Continuously monitors customers and operations to spot issues. Faces reality and adjusts to keep commitments. Models confidence that sees change as opportunities. Uses Boeing complexity as leverage, not an excuse.

Inspires Others

- Energizes, excites, and motivates others.
- Builds teams whose impact is far greater than the sum of their parts.
- Creates an atmosphere where all see opportunities to stretch, take risks, create, contribute and learn

Lives the Boeing Values

- Models, leads and is committed to the Boeing values, principles and business-conduct policies. Earns the trust and respect of all Boeing stakeholders.
- Ensures effective business, compliance and financial controls.
- Promotes integrity in all that we do..

Sets High Expectations

- Sets high expectations rooted in ensuring competitiveness.
- Holds self and others accountable for continuous improvement.
- Communicates expectations directly, openly and effectively. Shows people and teams how to reach (acts as a coach).

Figure 10: Boeing Leadership Attributes for Program Managers

For the purposes of this study, the Boeing Senior Level PM is used. Senior PMs must possess the following competencies to lead any project or program (Boeing, 2011):

- **General Competencies**
    - **Build Positive Relationships**: Proactively build effective working relationships with fellow middle managers and other people throughout the organization.
    - **Business (Operational) Acumen**: Serve as a resource for knowledge of how the department and organization operates; knowledgeable in current and possible future policies, practices, trends, and information affecting the department and organization.
    - **Cross Functional Partnerships**: Analyze the organization and own area to identify key relationships that should be initiated or improved to further the attainment of goals; implement effective means for monitoring and evaluating the partnership process and the attainment of mutual goals.
    - **Driving For Business Results**: Systematically evaluate business opportunities and target those opportunities with the greatest potential for producing positive business results; work tenaciously toward and derives satisfaction from achieving stretch goals related to positive business results; prevent irrelevant issues or distractions from interfering with timely completion of important tasks.
    - **Establish Strategic Direction**: Identify/recognize the need for additional information and obtain it by clearly describing what needs to be known and the means to obtain it
    - **Initiating Action**: Consistently take immediate action when confronted with a problem or when made aware of a situation in own or other work area.
    - **Political Awareness**: Consistently and proactively identify political consequences of actions to direct reports / project leaders; assess the political environment and potential ramifications, and provide coaching on

how to manage ideas and actions to effectively navigate the political environment.

- **Technical Competencies**
  - Earned Value Management: Thorough understanding, in order to provide advice to subordinate managers, of the Earned Value Management System (EVMS) and its application.
  - Risk/Issue/Opportunity Mgmt: Strategic knowledge of risk, issue and opportunity management principles and tools and the ability to apply them in various situations.
  - Schedule Management: Extensive and specialized knowledge of schedule management principles and practices.
- **Basic Qualifications**: Minimum of 3 years previous experience in a managerial role in operations or technical organization and a minimum of 5 years of direct experience managing a technology based development program using the Program Management Best Practices (PMBP).

Summary

In the next chapter, the FAI certification program and Boeing PM competencies discussed are compared to and analyzed against Air Force PMs that are certified through DAU. This will assist in determining how the competencies align among PMs.

V. Comparison and Analysis

In order to determine if the Air Force equipping the PM workforce with the right competencies, this chapter compares and analyzes the various competency models described in Chapters 3 and Chapter 4 while answering the research questions to determine if there is a major gap among the program manager competencies of the Air Force, FAI, and Boeing.

Question #1: How do the Air Force certification requirements align to FAI?

From below, the FAI certification focuses more on the management of projects than DAU. DAU certification does not require project management experience, but as previously defined in Chapter 2, Program Management is the process of managing several related projects, often with the intention of improving an organization's performance. Although both are transferable to other agencies, the FAI certification is more widely accepted aligning federal agencies on the same program management track. This would allow easier interagency and federal program transitioning. However, FAI certification is not mandatory like Air Force PMs assigned to acquisition coded slots. Mandating the training ensures PMs are exposed to the knowledge, skills, and experiences needed to perform their duties and responsibilities.

Table 16: Certification Program Comparison

	Air Force (DAU Certification)	Federal Acquisition Institue (FAI)
Type of Certification	General Program Management	General Program and Project Management
Mandatory Requirement	Yes for all acquisition coded positions only	No unless programs considered major acquisitions must be senior-level certified
Required Completion Time	24 Months	12 Months
Certification Recognized By other Agencies	Yes	Yes
Other Agencies	Among DOD agencies	PMI and Other Federal Agencies except DOD
Wavierable Requirements	Yes; Required Completion Time	Yes; Required Completion Time and Mandatory Requirement
Experience Required:		
Level I/ Entry	1 year of acquisition experience	At least **one** year of project management experience within the last five years.
Level II/ Mid-Level	2 years of acquisition experience w/ 1 year in program management	At least **two years** of program or project management experience **within the last five years** that includes experience at the entry level
Level III/ Senior	4 years of acquisition experience w/ 2 yr in PM office and 1 yr as PM with cost, schedule, and performance experience	At least **four years** of program and project management experience on federal projects and/or programs, including developing, managing and evaluating agency acquisition investment performance.

Question #2: What type of competency model was used?

Table 17: Competency Model Type Comparison

Agency	Core	Leadership	Functional	Job
Federal Acquisition Institute	X	X		
Air Force	X	X	X	X
Boeing	X	X	X	X

The Air Force, FAI, and Boeing focus on developing Program Managers with a combined competency model to ensure a well- rounded, highly competent development. Air Force and Boeing PMs have competencies aligned to the organizational and institutional mission, values, and foundational goals. These organizations have determined the kind of leadership behaviors critical for its success. The Air Force and Boeing focus on the development of functional competencies. Functional competencies are the important competencies to the related job The Air Force focus on function and job specific competency models by encouraging Core Plus training which is described in Chapter 3.. However, FAI focuses on the development of PMs as general PMs and leaders.

Question #3: How does AF PM General and Leadership competencies align to FAI?
The FAI competencies were discussed in Chapter 4, and the Air Force PM was provided in Chapter 3. By looking at Table 18, the Air Force shared six of the nine minimum FAI Entry Level general/leadership task for successful PMs. Developing skills such as conflict management and written communication allow better performance and in the five additional competencies that FAI does not feel P/PM need at this level. DOD Mission and Culture should fall under the Institute competencies.

Table 18: Level I General/Leadership Competency Comparison

Entry/Tactical Level Program Management Competencies		
Federal Acquisition Institute		**Air Force**
Leadership/Professional		**General/Leadership**
· Oral Communication	→	· Oral Communication
· Problem Solving	→	· Problem Solving
· Self-Management	→	· Self-Management
· Resilience	→	· Resilience
· Flexibility	→	· Flexibility
· Accountability	→	· Accountability
Conflict Management		· Creative Thinking
Written Communication		· Team Building
		· DoD Mission and Culture
Customer Service		
		· Decisiveness
		· Influencing/Negotiating

Table 19: Level II General/Leadership Competency Comparison

Mid-Level/ Operational Level Program Management Competencies	
Federal Acquisition Institute	**Air Force**
Leadership/Professional	**General/Leadership**
Influencing/Negotiating →	· Influencing/Negotiating
Partnering →	· Fostering Collaborative Relationships
Team Building/IPT →	· Leading People
Conflict Management →	· Conflict Management
Political Savvy →	· DoD Corporate Perspective
Strategic Thinking →	Strategic Thinking
Decisiveness →	· Planning/Evaluating
External Awareness →	· Leveraging Diversity
Developing Others →	· Developing Others
Creativity/Innovation	· Interpersonal Skills
	· Problem Solving
	· Customer Service
	· Oral Communications
	· Human Capital Management
	· National Security Foundation

Table 19 shows FAI and the Air Force have nine competencies in common at the Mid-Level . However, the highlighted AF ones (fostering collaborative relationships, leading people, and strategic thinking) was Institutional competencies. Conflict management and customer service that appears in AF operational level are FAI Entry level competencies. FAI creativity competency was an AF tactical level competence. AF competencies: interpersonal skills, problem solving, and oral communication was part the tactical level competence. National Security Foundation seems to fall under Institutional competencies.

Table 20: Level III General/Leadership Competency Comparison

Senior/ Strategic Level Program Management Competencies		
Federal Acquisition Institute		**Air Force**
Leadership/Professional		**General/Leadership**
External Awareness	→	- External Awareness
Vision	→	- Vision
Strategic Thinking	→	- Strategic Thinking
Entrepreneurship	→	- Entrepreneurship
		- Political Savvy
		- Global Perspective
		- National Security Strategy
		- Technology Management
		- Financial Management
		- Creativity & Innovation
		- Partnering
		- National Defense Integration
		- National Security Environment

FAI has four competencies at the General/Leadership competency level, and the AF Strategic level contains them all. There are nine additional AF strategic competencies in Table 20. Political savvy, global perspective (external awareness), creativity and innovation, and partnering were in Table 20 as FAI Mid-level competency. Technology and Financial Management are competencies that are covered in the technical competence area. National Security Strategy, National Defense Integration, and National Security Environment are better suited under Institute competencies.

Question #4: How does an AF PM technical competency align to FAI?

Table 21: Level I Technical Competency Comparison

Entry Level Program Management Competencies		
Federal Acquisition Institute		**Air Force**
Technical		**Technical**
· Project Management	→	· Project Management
· Systems Engineering	→	· Systems Acquisition
· Contracting/Procurement	→	· Contracting/Procurement
· Business, Cost Estimating & Financial Management	→	· Earned Value Management
Test and Evaluation (T&E)		· Skills required by CFETP
Life Cycle Logistics (LCL)		· Risk Management

Table 22: Level II Technical Competency Comparison

Mid-Level/ Operational Level Program Management Competencies		
Federal Acquisition Institute		**Air Force**
Technical		**Technical**
· Management Processes	→	· Project Management, Risk Management
· Systems Engineering	→	· Systems Acquisition
· Contracting/Procurement	→	· Contracting/Procurement
· Business, Cost Estimating & Financial Management	→	· Earned Value Management
Test and Evaluation (T&E)		· Skills required by CFETP
Life Cycle Logistics (LCL)		

Table 21and Table 22 map technical competency levels. Each of the same technical competencies. Four of the competencies map from FAI to AF: Management Processes (Project & Risk Management), Systems Acquisitions/Engineering,

Contracting/Procurement, and Business, Cost estimating & Financial Management (Earned Value Management). Two of the key FAI technical competencies are not tactical or operational competencies. However, these topics are covered in the CFETP, but do not necessarily mean the PM will be assigned them. CFETP tasks are assigned based on function and job-specific.

Table 23: Level III Technical Competency Comparison

Senior/ Strategic Level Program Management Competencies		
Federal Acquisition Institute		**Air Force**
Technical		**Technical**
· Management Processes	→	· Project Management, Risk Management
· Systems Engineering	→	· Systems Acquisition
· Contracting/Procurement	→	· Contracting/Procurement
· Business, Cost Estimating & Financial Management	→	· Earned Value Management
Test and Evaluation (T&E)		
Life Cycle Logistics (LCL)		

As shown in Table 23, Level III technical competency mapping is similar was with the previous two levels, but AF PM at the Strategic level is not required to accomplish CFETP task. Therefore, T&E and LCL competencies are not covered at the Strategic Level for AF PMs.

Question #5: How do AF PM competencies align to Boeing?

Table 24: Air Force and Boeing Strategic Level Comparison

Senior/ Strategic Level Program Management Competencies	
Air Force	**Boeing**
Leadership/Professional	**General/Leadership**
- External Awareness →	Delivers Results
- Vision →	Sets High Expectations
- Strategic Thinking →	Finds a Way
- Political Savvy →	Political Awareness
- Creativity & Innovation →	Establish Strategic Direction/ Initiating
- Partnering →	Cross Functional Partnerships
Entrepreneurship	Driving For Business Results
Financial Management	Schedule Management
Systems Acquisition	Build Positive Relationships
Contracting/Procurement	Business (Operational) Acumen
National Defense Integration	Lives the Boeing Values

Senior/ Strategic Level Program Management Competencies	
Air Force	**Boeing**
Technical	**Technical**
- Earned Value Management →	Earned Value Management
- Project Management →	Project Management
- Risk Management →	Risk/Issue/Opportunity Management
- Technology Management →	Technology Management

Table 24 shows how the AF and Boeing Technical competencies align; however, only half of the general/leadership competencies matched. As stated in in previous Research question #2, AF general leadership competencies (Financial Management, Contracting/Procurement) are more aligned to technical competencies. Boeing

general/leadership competencies could be considered repetitive based on the definitions in Chapter 4.

VI. Conclusion and Recommendation

This chapter provides a summary of the research and recommendations for the future research. The study research efforts and research questions are summarized. Finally, recommendations for the future research are introduced.

Conclusion

With the continuous budget cuts and instability of the DOD programs, there will be a struggle to ensure that the Air Force have a highly- qualified and competent program management workforce. This study has presented the general issues, objective, and research questions of this research effort. The purpose of this benchmark study was to determine if the Air Force are developing and equipping PMs with right competencies to be successful in program management. This study will:

1. Determined the PM competencies of the Air Force,
2. Determined the PM competencies of the FAI certification program,
3. Determined the PM competencies of the Boeing,
4. Compared and analyzed the gap between Air Force PM to FAI and Boeing.

This research study has provided a detailed literature review on human capital and strategic planning. It addressed the DOD and AF need to develop a more competent PM workforce. AF certification and competencies for a PM were identified discusses. Benchmark was explained and some of the reasons why companies choose benchmarking. Program Management competencies were examined for FAI FAC-P/PM certification program and Boeing. PM competencies were compared and analyzed to determine gaps among AF, FAI, and Boeing. This analysis provided answers to the following research questions:

1. **How do the Air Force certification requirements align to FAI?** Certification programs seem to have similar requirements. However, for the federal PMs to be interchangeable among federal agencies, DAU should consider a Statement of Understanding with the FAI and align competencies accordingly.
2. **What competency model was used?** There is no common model. Competency models vary by organization and agency.

3. **How does AF PM general/leadership align to FAI?** Many of the competencies are shared at the same level; however, the AF operational and strategic leadership competencies should be re-evaluated to determine if they are in the right category. Technology and Financial Management are competencies that are covered in the technical competence area. National Security Strategy, National Defense Integration, and National Security Environment would be a better suited under Institute competencies
4. .**How do AF PM technical competencies align to FAI?** The FAC_P/PM focuses on covering all competencies through training and experience. The Air Force using the training task from the CFETP to cover technical competencies depending on the position or assignment location. There is no guarantee the task will be part of the mandatory training plan.
5. **How do AF PM technical competencies align to Boeing?** As stated in Research question #2, AF general leadership competencies (Financial Management, Contracting/Procurement) are more aligned to technical competencies. Boeing general/leadership competencies could be considered repetitive based on the definitions in Chapter 4.

Overall, AF PM Competencies were the same as those of FAI and Boeing; however, the level at where they appear differs. Compared to FAI, AF allows PMs to be certified and manage programs prior to having project management experience. This could result in the mismanagement of program and projects. This leads to further research to determine if the AF should introduce project management to future PMs prior to being certified.

Recommendations

To determine what areas of AF PMs are exceeding, meeting, and lacking in leadership and technical competencies, follow-on work is recommended in several areas:

- Conduct a workforce assessment to determine the current PM workforce experience, education, and training required.

- Seemingly missed in all the competencies structures is the type of education required; particularly technical education, and this really should be a crucial component of any AF PM developmental plan.
- Conduct job analysis, verify, and validate the data gathered to make sure that it aligns to the organization and mission requirements.
- Develop a new competency model based on best practices:
    - Define the criterion for successful program management.
    - Choosing a pool of PMs for data collection.
    - Collect sample data based on surveys, interviews, and historical evidence.
    - Develop hypotheses about the competencies of outstanding performers and how these competencies work together to produce desired results.
    - Validate the results of data collection and analysis.
    - Apply the competency models.
- Determine the competencies needed for successful program management. Develop, verify and validate the proficiency scale so that the points on the scale are criterion-referenced. OPM IT PM competency model may be used as guidance.

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14. ABSTRACT
Over the last decade, the Department of Defense (DOD) has redesigned its acquisition process and the allocation of funding which in turned has had a major effect on the Air Force Acquisition program management workforce. The current acquisition workforce continues to face serious shortages of highly skilled program managers resulting in programs and projects overrun, undermanaged, and unexplained increased cost. Highly skilled talent with the necessary technology competencies is in high demand. These skills are critical to the success of programs and mission accomplishments.
The purpose of this benchmarking study is to determine if the Air Force are developing and equipping their Program Manager (PM) with right competencies to be successful in program management. This study will identify and determine the PM competencies of the Air Force, FAI FAC-P/PM certification program, and Boeing. It will examine and analyze the Air Force certification requirement to FAI and PM competences to FAI and Boeing to determine any gaps exists.

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